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ONTARIO HYDRO ANNUAL REPORT 1980



75TH ANNIVERSARY



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REGIONAL DIRECTORS

- Central Region**
C. S. Elliott
5760 Yonge Street
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420 Dundas St. East
Belleville K8N 5C3
- Georgian Bay Region**
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93 Bell Farm Road
Barrie L4M 1H1
- Niagara Region**
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Box 157, 1053 Main St. West
Hamilton L8N 3B9
- Northeastern Region**
H. K. Wright
590 Graham Drive
North Bay P1B 8L4
- Northwestern Region**
D. D. Haig
34 Cumberland St. North
Thunder Bay P7A 4L5
- Western Region**
E. G. Bainbridge
1075 Wellington Road
London N6E 1M1

THE CHAIRMAN COMMENTS . . .

On Hydro's new challenges

With oil prices soaring and world reserves lessening, Ontario — and Canada — must seek alternative energy sources to heat our homes, fuel our trains and drive our industries. Without doubt, electricity is one of those alternatives, especially here in Ontario where two-thirds of our electricity is generated from sources indigenous to the province — water power and uranium. Recent provincial government initiatives point in that direction and Hydro is capable of meeting that challenge. The question is: how long will it take for the off-oil initiatives to take effect, and to what extent will the switch-overs occur? Our current surplus of generating capacity will take care of any immediate increase in demand. And the government's direction to speed up completion of Darlington nuclear station ensures the province of an ample supply of electricity 10 years from now. The price of oil and natural gas will be a major determining factor in any switch to electricity for home heating. Oil is now passing electricity in price. At the current rate of price escalation, we expect gas prices to exceed electricity by the end of the decade. But homeowners will hesitate before considering substitution without knowing what they are getting into. Because of this, Hydro is preparing a marketing plan that will provide homeowners with reliable information concerning energy efficiency in the home, new products and systems, and advice about their applications. As well as encouraging electric home heating, the government has plans for the electrification of the GO Transit rail system, the production of



Hydro Chairman Hugh Macaulay (right) turned over the keys to one of 12 electric vehicles being tested by Hydro to Ontario Premier William Davis, who said his drive was "comfortable . . . fun."

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Western Region
E. G. Bainbridge
1075 Wellington Road
London N6E 1M1

REPORT OF THE
BOARD OF DIRECTORS
OF ONTARIO HYDRO FOR
THE YEAR 1980

To The Honourable Robert Welch,
Minister of Energy

We, the Board of Directors, submit to you this report of the financial position and relevant Ontario Hydro activities for the year 1980. We would like to thank you and the staff of the Ministry of Energy for the cooperation and understanding extended during the year. Finally, since the publication of this report coincides with Hydro's 75th anniversary, we direct your attention to the brief history of the Corporation carried as a supplement to this report.

On behalf of the Board

Hugh L. Macaulay
May, 1981

THE COVER

The essentiality of electricity in our day-to-day lives is often taken for granted. We tend to forget its importance in our homes, industries, hospitals and on our streets and highways. It is also an important ingredient in the recreation and entertainment that bring relief to the problems of everyday living. The cover reflects some of the principal photographs contained in this report, all of which remind us that electricity has become an essential part of modern life.

THE CHAIRMAN COMMENTS . . .

On Hydro's new challenges

With oil prices soaring and world reserves lessening, Ontario — and Canada — must seek alternative energy sources to heat our homes, fuel our trains and drive our industries. Without doubt, electricity is one of those alternatives, especially here in Ontario where two-thirds of our electricity is generated from sources indigenous to the province — water power and uranium. Recent provincial government initiatives point in that direction and Hydro is capable of meeting that challenge. The question is: how long will it take for the off-oil initiatives to take effect, and to what extent will the switch-overs occur? Our current surplus of generating capacity will take care of any immediate increase in demand. And the government's direction to speed up completion of Darlington nuclear station ensures the province of an ample supply of electricity 10 years from now. The price of oil and natural gas will be a major determining factor in any switch to electricity for home heating. Oil is now passing electricity in price. At the current rate of price escalation, we expect gas prices to exceed electricity by the end of the decade. But homeowners will hesitate before considering substitution without knowing what they are getting into. Because of this, Hydro is preparing a marketing plan that will provide homeowners with reliable information concerning energy efficiency in the home, new products and systems, and advice about their applications. As well as encouraging electric home heating, the government has plans for the electrification of the GO Transit rail system, the production of



Hydro Chairman Hugh Macaulay (right) turned over the keys to one of 12 electric vehicles being tested by Hydro to Ontario Premier William Davis, who said his drive was "comfortable . . . fun."

steam from Hydro generators for industrial use and the expansion of our hydro-electric capacity. Ontario Hydro has 75 years of dependable and dedicated service behind it. We can, and will, adapt to these new challenges.

On transmission limitations

We have enough power, but our ability to deliver it suffers some severe limitations. Put simply, our transmission lines, especially in the southwest, are nearing capacity and are incapable of carrying all the new, cheaper and less polluting generation from our nuclear stations. The last unit of Bruce B nuclear station will be completed in 1987, but the second transmission line from the station is still in the early stages of the public participation process. It now appears doubtful we can obtain local and government approval of the line and complete its construction by 1987; doubtful, that is, unless the approval process can be accelerated. If not, there is some probability that nuclear power will be locked in and we'll have to substitute more expensive coal-fired generation. The need for this line to feed the growing demand in Southwestern Ontario has been established and was accepted by the Royal Commission on Electric Power Planning in its 1980 report. But the situation isn't unique to the southwest. All our systems, including the North and the Ottawa area of Eastern Ontario, need strengthening to meet even the reduced load growth forecasts averaging 3.1 per cent a year to the year 2000. Couple this growth with the new government thrust toward greater use of electricity and it becomes evident we must increase our ability to get power to where it is needed.

On air quality control

We know that emissions from our coal-fired stations are substantial. We know also that Hydro's contribution accounts for only two to six per cent of the total that falls in Ontario's sensitive areas in the form of acid rain. In contrast, about two-thirds can be attributed to U.S. sources. But that fact doesn't give Hydro the right to ignore the problem. Elsewhere in this report is a more detailed account of our actions to date, but I would like to point out here that we've already spent millions of dollars on washed and low sulphur coal, and on blending facilities to reduce our emissions. More importantly, we'll be spending at least another half billion dollars on the problem in the next 10 years. During this time, we'll reduce our acid gas emissions by 50 per cent while at the same time increasing our production of electricity by 50 per cent, including the



Ontario Hydro's Board of Directors share a casual moment. Left to right: President Milan Nastich, J. Dean Muncaster, Chairman Hugh L. Macaulay, A. Ephriam Diamond and Alan B. Cousins.

addition of new coal units. I'd like to emphasize that the 50 per cent reduction program was worked out with the Ministry of the Environment, and the limits it sets on the amount of emissions in 1990 are absolute — we're committed to meeting them no matter what the future may hold — no matter how much coal we may burn. We expect that 20 per cent of the reduction will result from the installation of scrubbers and about 50 per cent from nuclear power replacing coal generation. The balance will come from placing special burners in our large coal-fired stations, increased use of hydro-electric facilities and using more low-sulphur coal. It is going to be an expensive business — one where expectations must be balanced against the willingness of the people of Ontario to pay the increased costs. But unless we take practical measures to clean up our own backyard, we can't expect our neighbours to the south to face up to their share of the responsibility.

On the export of electricity

The export of electricity to the U.S. makes economic sense for Ontario. Over the past three years Hydro has earned about \$440 million in net revenues from export sales — revenues that helped us to hold down rates to our Ontario customers. And those sales also helped reduce Canada's balance of payments with the U.S. Furthermore, we expect to have the capacity available to export a substantial amount of electric energy for at least the next 10 years. We intend to market that power and we have the backing of the Ontario

government to do so. Consequently we have applied to the National Energy Board for renewal and expansion of our export licenses. Later this year Hydro may be seeking approval to construct a high voltage, direct-current cable interconnection under Lake Erie for the sale of firm power to the General Public Utilities system in Pennsylvania. Stronger interconnections at Niagara are planned, and we are pursuing export sales at every opportunity. It is simply good business for Hydro and for our customers.

On costing, pricing and rates

For some time Hydro has been discussing a new costing and pricing system with our customer groups. The objective is an acceptable, equitable system that accurately reflects how customers use electricity and the cost of supplying power to different customers at different times. We had hoped to include this new structure as part of our 1981 rate proposal that would have been implemented in 1982. At the request of some of our customers for more time to study the proposals — which are complicated — this has been postponed for one year. In the matter of Hydro rates, Hydro was able to hold the 1981 increase to 9.4 per cent. We expect that for the next few years any increases Hydro requires will be equal to, or slightly below, the rate of inflation. This has been possible mainly because of the relatively stable costs of Ontario's nuclear and hydro-electric resources, as well as revenues from our export sales.

On Hydro's 75th anniversary

Included with this annual report is a brief history of Hydro's first 75 years. It is the story of the long struggle for public power in Ontario and of the dedication and skills of the men and women who built the system. While we can be proud of the past, we must look at today and the future. The period immediately ahead will call for Ontario Hydro to make many adjustments to meet quickly-changing conditions. And while adapting to those changes, Hydro must continue to plan for the future — to the year 2000 and beyond — for that is the nature of the energy world, where our resources are finite and our demands seemingly infinite. But I believe the dedication of Hydro employees will successfully meet these challenges, and that the electrical system they operate, maintain and improve will serve this province well for years to come. Hydro's history also reflects its long association with the municipal utilities. I am proud to say that a constructive and cordial relationship continues today in our dealings with the Ontario Municipal Electric Association and the Association of Municipal Electrical Utilities.

On new appointments

The Hydro Board of Directors appointed Milan Nastich, executive vice-president of planning and administration, to be president, succeeding Doug Gordon, on November 1, 1980. Doug Gordon's 35 years with Hydro stand as a hallmark of service to the public of Ontario. Milan Nastich's appointment followed an extensive search both inside and outside the Corporation by the Board's Management Resources Committee. The new president has a distinguished record of service in his 32 years with Hydro in several branches of the organization. In 1972 he was named assistant general manager, finance — a position he held for two years before becoming vice-president. He became executive vice-president in 1978. His proven administrative record and leadership qualities will serve Hydro in good stead in meet-



Left to right: J. Conrad Lavigne, Robert J. Uffen, William A. Stewart, Sister Mary and William Dodge.



Left to right: Philip B. Lind, Arthur J. Bowker, Allen T. Lambert and William E. Raney, Q.C., Hydro's Secretary and General Counsel.

ing the quickly-changing conditions which we face in the 1980s. His position as executive vice-president, planning and administration was taken over by Arvo Niitenberg. Other new executive office appointments included: Vern

Coles, vice-president, distribution and marketing; John Matthew, vice-president, power system program; Dane MacCarthy, vice-president, corporate relations, and Sam Horton, vice-president, supply and services.

1980 marked the beginning of a new energy-use strategy

The first year of the 1980s was a critical one in the 75-year history of Ontario Hydro because it marked the beginning of a new energy-use strategy and a renewed awareness of the importance of electricity in Ontario's economy.

The shift in energy-use strategy was prompted by the provincial government's determination to reduce Ontario's dependence on oil — whether foreign or Canadian — and a commitment to the development of energy from alternative sources.

This heralds a renewed thrust for Hydro for the eventual provision of electrical power to replace costly oil in the transportation and space heating sectors.

However, total electricity use in

Ontario during 1980 continued to reflect conservation efforts as well as the slow growth in economic activity and creeping inflation. Primary energy demand in 1980 was 100.2 billion kilowatt-hours, compared to 98.1 billion kilowatt-hours in 1979 — an increase of 2.1 per cent compared to 2.9 per cent in 1979.

While this demand is the largest in Ontario Hydro's history, revised forecasts issued in January, 1981 show annual electricity demands in Ontario growing at an average 3.1 per cent until the year 2000. This is down from the 1980 forecast of annual growth of 3.4 per cent.

The major source of Hydro generation continued to be water power during 1980, providing 36.7 billion kilowatt-

hours, or 35 per cent of the total energy generated.

Nuclear power, however, was a very close second as the outstanding performance of the CANDU system continued during the year. Nuclear electricity production increased from 32.3 billion kilowatt-hours recorded in 1979 to 35.6 billion kilowatt-hours, an increase of three per cent to 34 per cent of the total energy generated. It was also the second year in a row that nuclear generation outpaced fossil-fuelled generation (coal, oil and natural gas) which accounted for 30 per cent of the total production.

The year 1980 was also a banner year for Ontario Hydro's eight nuclear reactors at Pickering and Bruce generating stations, which took the four top places among 114 world reactors with capacities exceeding 500,000 kilowatts.

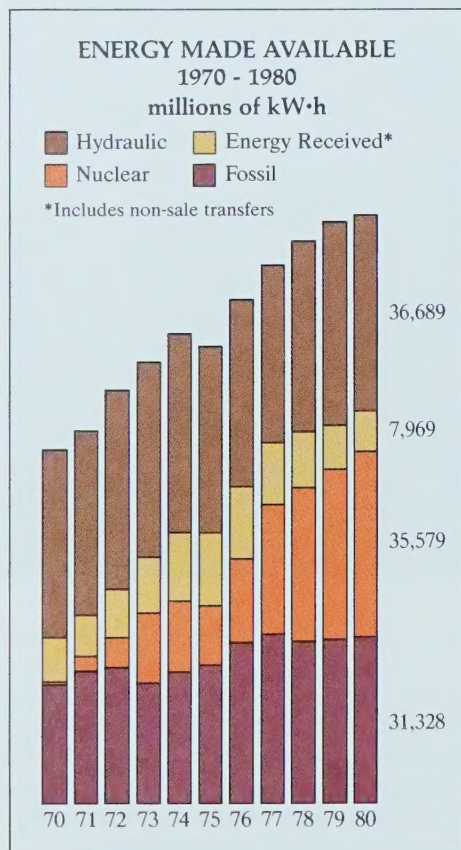
Again in 1980, as in the previous year, the peak demand for electricity came on December 17, reaching a new all-time high of 16,808,000 kilowatts — up 2.7 per cent from 1979. This peak was about 1.5 per cent lower than the forecast.

Generation Program

Forecasts of a slowing-down of load growth to the year 2000 led to a decision by the Board of Directors early in 1980 to stretch out construction of new generating stations planned under Hydro's long-range construction program.

The Board's decision was based on the economics of production and long-term security of supply. The Board also realized that — even with Hydro's lower rate of growth — the estimated peak demand in the year 2000 would nearly double the 1980 demand.

During the year, the provincial government emphasized a broadened energy strategy for Ontario. It announced new initiatives for the



Hydro technologist Bert Worth checks a section of the vacuum building at Pickering nuclear generating station.



Electricity will meet a larger share of the province's energy needs

development of alternate or renewable energy sources from wind, solar power, refuse and wood burning, peat, hydrogen and methane production. By year-end, Ontario Hydro was involved in about 30 such projects, many of them in cooperation with the Ministry of Energy, the Canadian Electrical Association and various schools and industries.

Then, early in 1981, the government announced its Board of Industrial Leadership and Development (BILD) program that called for electricity to meet an increasing share of the province's energy needs. Among other things, the program directed the construction schedule at Darlington nuclear station be accelerated, the electrification of the GO Transit rail system, encouragement of homeowners to switch from heating oil to electricity, a Hydro heat pump rental program and the sale of steam and hot water to industrial and agricultural interests near the Bruce Nuclear Power Development.

Work on the 300,000-kilowatt, two-unit extension of the Thunder Bay thermal generating station continued throughout most of 1980, and by year-end was virtually complete. Turbine testing of both units is expected to be complete by mid-1981. Construction of the 400,000-kilowatt, two-unit, lignite-fired station at Atikokan continued. The two units of this plant are expected to be in-service by 1984 and 1988 respectively.

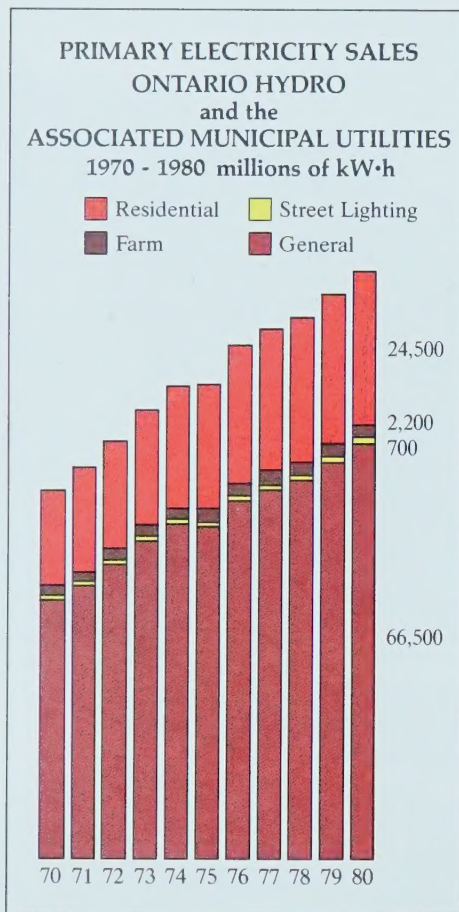
In the nuclear division, Douglas Point was returned to service at 70 per cent power capacity in October, pending approval for full power operations by the Atomic Energy Control Board. In May, all units at Pickering were shut down to allow inspection of the vacuum building — a prerequisite to preparations for the commissioning of Pickering B station, which is now underway. A program commenced which will integrate all the engineering activities associated with potential Pickering unit shutdowns in the mid-1980s, to make adjustments or replacements associated with pressure tube elongation and new safety system additions.

At the Bruce Nuclear Power Development, preliminary work commenced on the engineering for a steam line to supply a proposed industrial development adjacent to the site. Also at Bruce, construction of the B generating station was close to plans for a 1983 in-service date for the first of four units, while commercial operation of the Heavy Water Plant B was delayed by material problems. Bruce Heavy Water Plant A produced 623 megagrams (687 tons) of reactor-grade heavy water during 1980.

Export Sales
Export sales of electrical energy to the United States fell to 10.7 billion kilowatt-hours in 1980 from a record high of 11.7 billion kilowatt-hours in 1979. The drop is attributed to the slowdown in the automotive industry and transmission limitations in New York State. Despite this decline of eight per cent, net revenues rose to \$162 million, an increase of \$8 million over the previous year, all of which is passed on to Ontario consumers.

Early in 1981 Hydro signed a letter of intent with General Public Utilities, New Jersey, calling for delivery of the total output from J. Clark Keith generating B station, which is now underway. A program commenced which will integrate all the engineering activities associated with potential Pickering unit shutdowns in the mid-1980s, to make adjustments or replacements associated with pressure tube elongation and new safety system additions.

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ENERGY MADE AVAILABLE: 1980

	1980 Millions of kW·h	1979 Millions of kW·h	% Change Over 1979	% of Total 1980	% of Total 1979
Hydraulic	36,689	38,780	— 5.4	32.9	35.1
Thermal (coal)	30,934	28,540	+ 8.4	27.7	25.8
Thermal (natural gas)	404	1,481	—72.7	0.4	1.3
Thermal (oil)	—10	904	—	—	0.8
Thermal (nuclear)	35,579	32,322	+10.1	31.9	29.2
Total Generation	103,596	102,027	+ 1.5	92.9	92.2
Energy Received*	7,969	8,602	— 7.4	7.1	7.8
Total energy made available	111,565	110,629	+ 0.8	100.0	100.0

*Includes non-sale transfers.



The stranded motorist can appreciate two forms of protection — one provided by the friendly presence of an Ontario Provincial Police officer, the other by the welcome glow of a lamp standard where his car developed engine trouble.

Hydro activities continued to be a subject of great public interest

ating station to the U.S. utility. If reached, the agreement could benefit Hydro's customers in the order of \$5 million a year.

Conservation

Ontario Hydro's energy conservation program continued to emphasize the wise and efficient use of electricity through advertising, seminars and other information programs. In cooperation with the Ministry of Energy, a pilot residential energy audit was carried out in 300 homes in the Town of Aurora. A second energy audit project is under way in Brampton.

Development of the Oshawa and Scarborough field trials for customer load control and distribution system automation continued in 1980. Installation of load control and monitoring equipment was near completion in 400 homes in Oshawa. Computer control and data acquisition facilities were installed to demonstrate the various

load management techniques. Monitoring and scheduling of customer loads will begin in 1981.

Results of this monitoring program will improve the efficiency of the existing electrical system in the province and reduce the need for new generating facilities in the future. One way to accomplish this is to attempt to shift some customers' electricity needs from the period of high demand to the period of low demand (11 p.m. to 7 a.m.). This technique is called "load management."

In addition, Hydro took part in solar-assisted water heater and solar home demonstration programs. It also provided spot-checking to ensure compliance with Canadian Standards Association's heat pump installation standards.

Public Hearings

During 1980 Ontario Hydro continued to be one of the most scrutinized public utilities in the world. During the year

public hearings involved 38,834 staff-hours with a related cost of about \$1.7 million. These hours included preparing information for and attending hearings of Ontario's Select Committee on Hydro Affairs studying the safety of nuclear reactors and the management of nuclear fuel wastes, and Ontario Energy Board hearings into Hydro's application for increased bulk power rates in 1981. Preparations were also made for 1981 hearings by the provincial Environmental Assessment Board and the National Energy Board. Since 1974, when public review of Hydro rates was first instituted by government, Hydro's directly related costs for public hearings have been about \$14 million.

Early in 1980 the select committee concluded that Hydro's nuclear reactors are "acceptably safe", while its final report tabled in June contained 24 recommendations. This report was seen to buttress the earlier report from Dr. Arthur Porter's Royal Commission on Electric Power Planning, which concluded after a five-year study that the use of nuclear power is essential to Ontario. It also urged steps to build public confidence in the safety of its use.

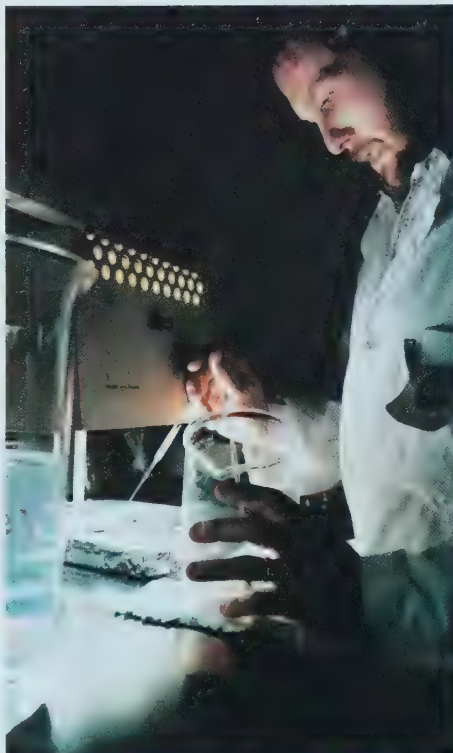
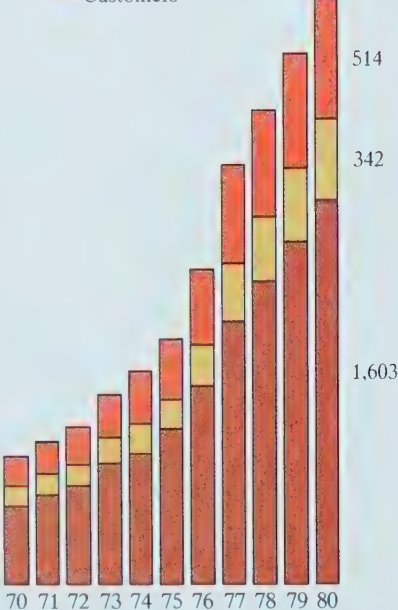
Customers, Rates and Costs

In 1980, the Ontario Government announced the allocation of \$20 million from provincial revenue to Ontario Hydro to reduce the electric bills of year-round rural residential customers in 1981. It is step one in the program to reduce the rural/ municipal residential rate differential. For most year-round residents, the reduction will be about \$3.00 per month and brings the differential from an estimated average of 28 per cent to about 20 per cent.

Increases in wholesale power rates announced in 1980 following public hearings by the Ontario Energy Board were implemented on January 1, 1981. The increases amounted to 9.3 per cent to Ontario's 324 municipal utilities, 9.6 per cent to about 100 large, direct industrial customers, and 11.2 per cent to 770,000 rural customers served directly by Hydro. The increases were due pri-

REVENUE FROM SALES OF
PRIMARY POWER AND ENERGY
million \$

■ Rural Retail
Customers ■ Municipal
Utilities
■ Direct Industrial
Customers

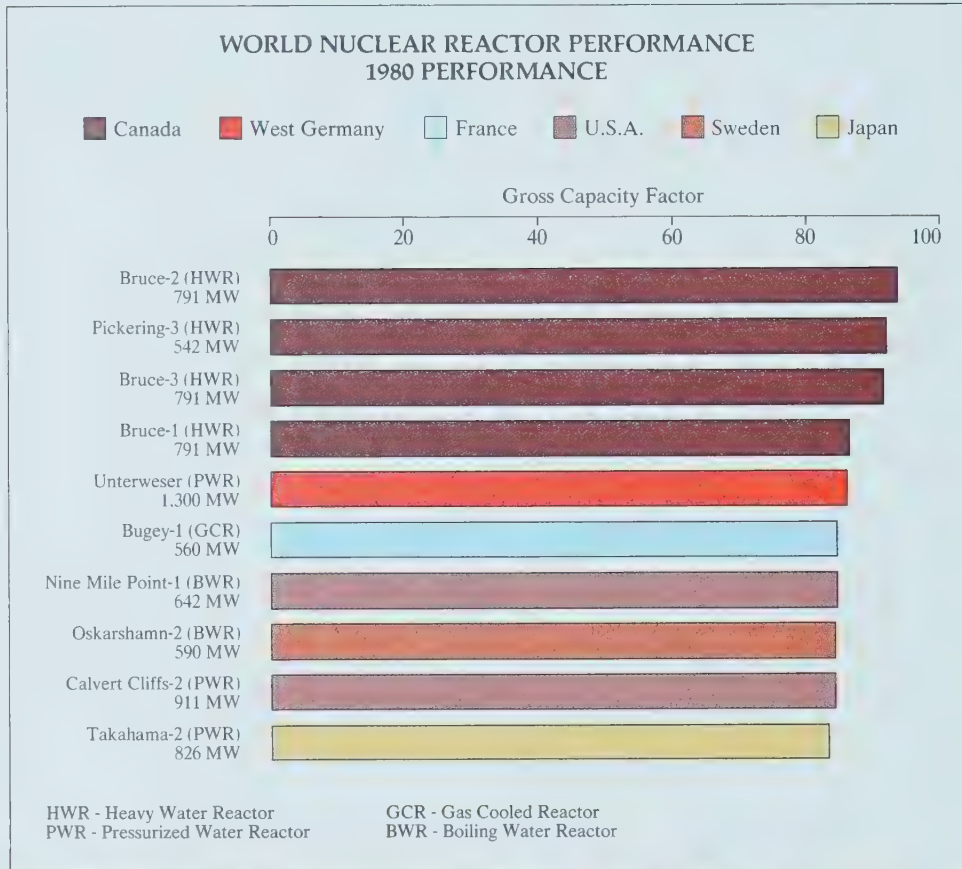


At Hydro's research laboratory in Etobicoke, technologist Werner de Vries conducts an analysis of gases in nuclear fuel.



What would happen to our enjoyment of live entertainment — whether at the Stratford Festival or at ethnic presentations such as this dance at the Japanese Cultural Centre in Don Mills — without the effective contribution of electricity?

Bilingual billing service was extended in the east and in the north



marily to the escalating fuel, maintenance and administration costs, interest and foreign exchange, depreciation, statutory debt retirement obligations and financing of the system expansion program. As a result of municipal utility restructuring, some 25,300 Ontario Hydro customers, together with distribution system plant valued at \$20.8 million, were transferred to 12 municipal utilities in the Regional Municipalities of Niagara, Durham and Halton. This brings the totals since 1978 to year-end 1980 to some 75,700 customers and plant valued at \$60.5 million transferred to restructured utilities.

Late in 1980, bilingual billing service was extended to 11 designated areas in the eastern and northern parts of the province, with new equipment allowing selective mailing of French and English material to customers.

In a report delivered in 1979, the Ontario Energy Board recommended changes in the way costs of electricity are calculated and prices are set, including off-peak hours and seasonal demands. Following an extensive study by Hydro, policy proposals were presented to municipalities, large industrial customers and agricultural groups which were to be included in Ontario Hydro's 1982 rate proposals. Early in 1981, the Ontario Hydro Board of Directors agreed that the affected customers had not received sufficient time to study and respond to the complex proposals and postponed for one year the submission of revised policies in the rate-setting process.

Transmission Systems

After almost 10 years of public hearings, litigation and government inquiries, the 500,000-volt (500-kV) line from Bruce generating station to the Milton transmission station was finally completed through the Town of Halton Hills and placed in-service in June, 1980. A second major transmission line from this nuclear power development is still in the planning stage.

Construction of the 500-kV line from Lennox generating station to Cherrywood transformer station was also com-



A 135-kilowatt Mini-Hydel generating station has been installed and commissioned at Waddell Falls, one of two hydro-electric sites being developed for them in Ontario.



Studies were begun on a submarine interconnection across Lake Erie



Construction continues apace as Workmen assemble steel girders at the Bruce B nuclear plant 200 kilometres northwest of Toronto.

pleted and was placed in-service in May, 1980, while the 500-kV line from Claireville transformer station to Cherrywood commenced in 1980 and is scheduled to be completed by the end of 1981. New 500-kV stations at Claireville and Cherrywood were placed in-service in 1980.

During the year, studies were initiated on a direct-current submarine cable interconnection across Lake Erie with General Public Utilities in Pennsylvania. Lake investigations were carried out during the summer months and work began on the preparation of tendering documents for the cable and the converter station. The planned completion date for the project, if approved, is December, 1984. National Energy Board approval, including environmental review, is required.

In addition to the 500-kV lines and stations, a number of 230 and 115-kV lines and stations projects were completed during the year. A total of 105 circuit kilometres (65 circuit miles) of new line was constructed and 150 circuit kilometres (93 circuit miles) of reconductoring existing lines was completed. Four new transformer stations were completed and placed in-service, and additional capacity or switching was added at five major existing stations.

One of the largest forest fires in Northern Ontario's history damaged transmission lines during the summer and left the community of Red Lake without electrical power for five days. Line and forestry crews, supported by helicopters, worked 17-hour shifts replacing 100 wooden poles along the 13-kilometre (eight-mile) line, completing the task before the evacuated residents returned to their homes.

Ontario Hydro's Transmission Effects Demonstration Centre near Barrie attracted more than 1,100 visitors during the past year, including Ontario res-

idents, representatives of U.S. utilities and farm groups — as well as many Hydro employees. The centre, designed to demonstrate the effects of 500-kV lines on people, animals and farm equipment working beneath them, is developing a mobile demonstration unit scheduled for service this year.

During 1980, more than 80 projects were in progress to select routes for transmission systems, including the upgrading and relocation of older power lines and the construction of new transformer facilities. Regulatory authorities approved 22 of these projects to proceed to property acquisition and construction. The remainder are in various stages of completion.

Ontario Hydro tries to recognize adequately the importance of public participation in the planning of project work. As a result, Hydro again relied on the valuable contributions made by the public and all levels of government involved in planning programs to expand and improve the provincial electrical system.

During the year, 16 committees made up of local citizens and municipal government officials assisted Hydro in this project work. The volunteer committee members examined the need for new facilities and the alternatives available, and indicated the values they place on several environmental factors.

Ontario Hydro staff also supported two major studies in Eastern and Western Ontario concerning future expansion of existing transmission facilities to meet the growing demand for electric power in these areas, and to improve system reliability and interconnection with United States and Quebec utilities.

Approximately 30,000 information handouts were provided to individuals involved in planning studies. Over 60 presentations were also made to local councils and groups involved in transmission and generation projects and 49

Divers from Hydro's research division (right) install underwater strobe lights at the Bruce generating station to discourage fish from approaching the plant's cooling water intakes. And below, a fish-eye lens provides a dramatic photo of a tower-lifting machine used in upgrading existing transmission lines.



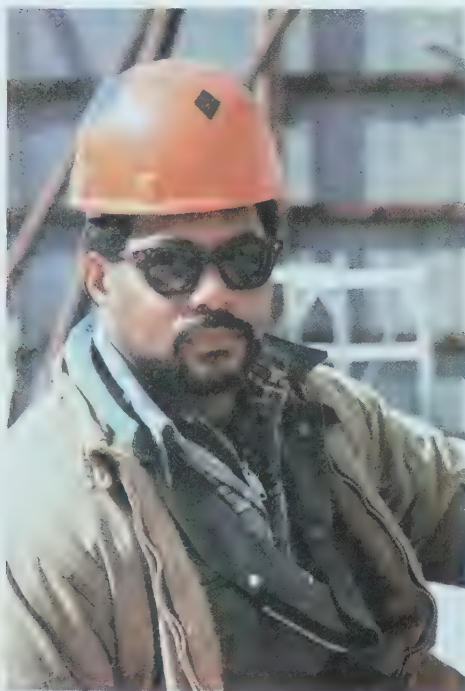
Hydro engineer Bill Chisholm uses these scale models to test the effects of lightning strikes on various types of transmission towers.

Assembly-line workers at the American Motors (Canada) Ltd. plant in Brampton use electric welding equipment in building Concord and Eagle automobiles — a visually spectacular indication of the importance of electricity to the industries of Ontario.

Hydro continued its involvement in uranium exploration programs



The faces of workers at Hydro's Bruce nuclear development



information centres established within project study areas.

Fuel Supplies

Ontario Hydro spent \$674 million on fuels for generation during 1980, compared to \$606 million in 1979 — an increase in costs of 11.2 per cent.

Total coal deliveries to generating stations from U.S. mines totalled 8.2 million megagrams (9.1 million tons). The bulk of these deliveries were made under long-term contracts. Movement of Western Canadian bituminous coal by the integrated transportation system amounted to 2.6 million megagrams (2.9 million tons) delivered to East System stations, principally Nanticoke generating station.

Deliveries of residual oil totalled 300,000 barrels for electricity production requirements at Lennox generating station and to support the steam production requirements of the Bruce Heavy Water Plant. Natural gas deliveries of 4.7 billion cubic feet to Hearn generating station were approximately 71 per cent less than in 1979.

Development of facilities for the production of uranium supplies under contract with two Elliot Lake producers continued in 1980.

Initial deliveries under the contract with Denison Mines Limited commenced in 1980 as scheduled. A 1979 lease agreement with Uranium Canada Limited for uranium concentrates was retired in late 1980.

Ontario Hydro continued its involvement in uranium exploration programs carried out by Shell Canada Limited, Amok Limited, Norcen Energy Resources Limited and Canadian Nickel Company Limited. Participation is on a modest scale and is intended to ensure the continued availability of adequate domestic uranium supply alternatives at competitive prices, particularly in light of the active involvement of foreign interests in Canadian uranium exploration.



Health physics technician Doug Kartz runs clerical staffer Susan Drane through the whole body counter at Hydro's central safety services division in Pickering. The counter is used to determine whether workers have inhaled or ingested any radionuclides at the nuclear plant.

The skill and dedication of Hydro staff members was a key factor



Technician Brian Handy needed snowshoes to reach this acid rain monitor at a remote research station operated jointly by Ontario Hydro and the Ministry of the Environment.

Purchases

The total value of Ontario Hydro awards for fuels, equipment, materials and services during 1980 was \$1.7 billion. This represents an increase of \$100 million from 1979. During 1980, outstanding commitments remained at \$2.6 billion.

Canadian sources, excluding primary fuels, received 79.7 per cent of the total value of 1980 purchases, 90.9 per cent of which was awarded in Ontario. This represents an increase of 2 per cent in the value of Canadian awards from 1979. The equipment and materials expenditures will create 14,000 man-years of employment in Ontario.

In general, the availability of material was adequate during 1980, with cost increases reflecting inflationary trends.

Human Resources

The skill and dedication of Hydro's 28,900 staff members was a key factor in the Corporation's ability to meet Ontario energy needs during 1980. Several measures were initiated during the year toward career planning and effort was extended to encourage women to develop careers within Hydro.

Safe working conditions again commanded serious attention, and — despite the formation of a task force to analyse accidents and the introduction of system safety techniques — there were three occupational fatalities in 1980. The disabling injury rate was 5.3 per million man-hours and the days lost due to injury were 0.4 per cent of scheduled working days.

A collective agreement with members of the Ontario Hydro Employees' Union resulted in pay increases of about 10 per cent effective April 1, 1980 with provision for further increases in the second year of the agreement. An overall pay increase averaging 10 per cent was awarded to members of The Society of Ontario Management and Professional Staff by arbitrator Judge George Ferguson.

Nuclear Safety

Nuclear safety received considerable attention in 1980. Environmental mea-



Dozens of overhead heat lamps are vital to the birth and survival of more than 20,000 birds hatched each week at King Cole Ducks Ltd. near Newmarket.

Hydro announced programs to cut acid gas emission by 50 per cent

surements of radioactivity in the vicinity of Hydro's nuclear plants were less than one per cent of emission limits approved by the Atomic Energy Control Board. In the nuclear power program there were no public or occupational fatalities or injuries due to radiation exposure.

Improvements were made to the contingency plans to be followed at Hydro's nuclear stations in the event of an emergency. Changes — based on analyses of both the Three Mile Island accident and the Mississauga train derailment — involved evacuation procedures and liaison with police and other authorities.

Air Quality Control

Early in 1981 Ontario Hydro, in conjunction with the Ministry of the Environment, announced it will undertake a \$500 million, 10-year program to cut emissions of acid gases from its coal-fired generating stations by about 50 per cent by 1990. The program, which was agreed to by the Board of Directors and which later became the basis for an Environment ministry regulation, includes the design and installation by 1987 of flue gas scrubbers on two units at either Lambton or Nanticoke — two major coal-fired stations. Scrubbers are capable of removing 90 per cent of the sulphur dioxide from the flue gas stream. In addition, special burners will be installed at Lambton, Nanticoke and Lakeview generating stations to cut emissions of nitrogen oxide.

As part of the program, Hydro will continue purchases of hydro-electric power from Manitoba, increase its buying of low-sulphur coal for blending and continue to purchase washed coal. It is also expected that a lower average load growth of 3.1 per cent through to the year 2000, start up of nuclear units

at Bruce B, Pickering B and Darlington between 1983 and 1991, and a second 500-kilovolt line from Bruce generating station will help lower emissions by decreased dependency on coal-fired generation.



Larry Rankine prepares one of the more than 150,000 radiation dosimetry badges worn each year by Hydro's nuclear plant workers.

Research, Design and Development

The start of engineering and procurement activities for the installation of facilities for a tritium removal system at the Pickering generating station began in August after approval by the Board of Directors. This facility is to be in-service in 1985 and will cost approximately \$58 million. It will remove radioactive tritium from the Pickering reactors and concentrate it in a chemical form that can safely be stored. One year's production of tritium at Pickering would just about fill a plastic grocery bag. The facility has been designed to maintain and improve worker safety within the plant, and to develop Hydro's expertise in specialized areas of hydrogen technology, which is vital in the development of future hydrogen energy systems.

As part of Hydro's commitment to produce another 2,000,000 kilowatts of electricity from water power, 17 possible hydro-electric sites have been identified throughout Ontario. Upgrading and renewal of generating equipment at several older hydro-electric stations continued during the year. Installation and commissioning of the prototype Mini-Hydel generating station — a 135-kilowatt unit — were carried out at Wasdell Falls near Orillia. This is a pre-fabricated, water-powered generator designed to replace diesel units for the supply of power to remote communities. A second unit will go into operation at Sultan, 20 miles from Chapleau, in 1981.

While the bulk of Hydro's research concerned high-technology research in all aspects of electrical generation, studies continued in the use of solar energy, insulation and heat storage furnaces as part of the government's alternative energy program. Work is also continu-



*For little Kael Buck — and for
his furry bedmates — the long and lonely
journey down the hallway to his
parents' room is made less terrifying
by his friend, the night light.*

ing, in cooperation with the federal government, on the safe storage and disposal of nuclear wastes and on acid gas emission and their control.

Energy Security

Hydro also is involved in a broad range of energy security initiatives aimed not only at conserving energy, but substi-

tuting electricity for oil, and developing alternate or renewable energy sources. Some of these projects are undertaken in cooperation with the Ontario Ministry of Energy, the Canadian Electrical Association and various universities and industries.

They involve the search for energy from wind, wood and refuse burning, hydrogen, methane, biomass, peat and

algae culture. Photovoltaic solar cells are also being tested, as is the feasibility of using hot water and steam from nuclear stations, to heat greenhouses.

Hydro also received in 1980 the first of up to 20 electric vehicles as part of a two-year test program to evaluate their impact on the electric system should they come into widespread use because of rising gasoline prices.

Hydro is financially self-sustaining, derives no revenue from taxes

The Corporation

Ontario Hydro is a special statutory corporation established by the Provincial Legislature in 1906 with broad powers to produce, buy and deliver electric power throughout the province.

The Corporation's primary responsibility is to provide power to municipalities — over which it has certain regulatory functions — which in turn distribute the power to customers in their areas. Hydro also supplies more than

100 direct industrial customers and about 770,000 retail customers in rural areas not served by municipal utilities.

Hydro is part of a massive electric grid that provides interconnections with Manitoba Hydro on the west, Hydro-Quebec on the east, and with utilities in New York and Michigan states to the south.

Ontario Hydro is a financially self-sustaining corporation that derives no

revenue from taxes.

The Power Corporation Act Revised Statutes of Ontario 1970, c. 354 as amended by which Hydro is governed sets out that power be provided to the municipal customers at cost. Costs are defined in the act as including charges for power purchases, operation, maintenance, administration, fixed charges and reserve adjustment. Fixed charges include interest, depreciation and the provisions for the retirement of debt over a 40-year period.

The Province of Ontario guarantees the payment of the principal and interest on bonds and notes issued to the public by Ontario Hydro. In the case of public borrowing in the United States, the Province borrows on behalf of Hydro by issuing its own debentures and advancing the proceeds to Ontario Hydro upon terms and conditions agreed upon between the Corporation and the Treasurer of Ontario.

Ontario Hydro is administered by a Board of Directors consisting of a chairman, a vice-chairman, a president and not more than 10 other directors. Regular review of strategy, programs and resources is a function of the Executive Office, composed of the chairman, the president, the two executive vice-presidents and the secretary and general counsel.





COMPARATIVE STATISTICS

	1980	1979	1978	1975	1970
Operating					
Dependable peak capacity ('000 kW)	24,457*	24,429*	22,845	18,667	12,670
December primary peak demand ('000 kW)	16,808	16,365	15,722	14,513	11,289
Primary energy made available ('000,000 kW•h) . . .	100,174	98,127	95,373	84,222	64,289
Customer					
Primary energy sales ('000,000 kW•h)					
Municipal utilities	64,898**	63,349	61,285	54,523	38,848
Rural retail	12,933**	13,011	12,927	11,049	7,567
Direct industrial	16,432**	15,757	14,775	12,588	13,680
Total	94,263**	92,117	88,987	78,160	60,095
Secondary energy sales ('000,000 kW•h)	10,727**	11,662	10,393	4,924	3,721
Total Ontario customers ('000)					
Residential	2,487**	2,449	2,411	2,239	2,014
Farm	111**	113	115	123	128
Commercial and industrial	322**	316	307	285	246
Total	2,920**	2,878	2,833	2,647	2,388
Average annual kW•h per customer					
Residential	9,930**	9,839	9,797	9,203	7,750
Farm	19,978**	19,225	18,279	15,914	12,305
Commercial and industrial	205,500**	204,113	200,601	188,583	174,339
Average revenue per kW•h (¢)					
Residential	3.64**	3.22	2.98	1.94	1.38
Farm	3.74**	3.42	3.21	2.24	1.76
Commercial and industrial	2.55**	2.35	2.17	1.39	0.94
Financial					
Bonds and other long-term debt issued (\$'000,000) .	1,462	1,405	1,847	1,601	494
Gross expenditures on fixed assets (\$'000,000)	1,529	1,659	1,694	1,442	511
Revenues (\$'000,000)					
Primary power and energy	2,458	2,222	1,849***	1,028	534
Secondary power and energy	361	346	289	43	20
Assets (\$'000,000)	15,593	14,514	13,163	8,593	4,613
Staff, average for year	28,902	28,385	27,850	25,361	22,584

* Includes mothballed generation; 1980 — 1,704,000 kW and 1979 — 550,000 kW

** Preliminary

*** After deducting excess revenues of \$130 million

Financial Review

Ontario Hydro's net income for 1980 was \$216 million as compared with \$268 million in 1979, a decrease of \$52 million. Income for 1980, however, was reduced by an extraordinary charge of \$160 million arising from the cancellation of the Wesleyville construction project when plans to complete an oil-fueled generating station at Wesleyville were discontinued.

Total 1980 revenues were \$2,819 million. Revenues from sales of primary power and energy in 1980 amounted to \$2,458 million, an increase of 11% over the previous year. This increase of \$237 million was primarily due to the 8.3% increase in bulk power rates and, to a lesser extent, increased volume of sales. In 1980 the total primary delivered load increased by 1.8% and delivered energy by 2.1% over 1979. Revenues from sales of secondary power and energy amounted to \$361 million in 1980, \$14 million or 4% higher than in 1979. This increase in secondary revenues resulted mainly from increased prices for sales of electricity to United States utilities.

Costs, excluding financing charges and the extraordinary item, totalled \$1,768 million in 1980 compared to \$1,646 million in 1979, an increase of 7%. Operation, maintenance and administration costs were \$640 million in 1980, an increase of \$38 million or 6% over 1979. This increase resulted mainly from the escalation of labour and material costs, and increased costs of operating and maintaining facilities in service. The cost of fuel used for electric generation increased by \$68 million to \$674 million in 1980 reflecting an 8% increase in the volume of electricity generated by thermal stations and an 11% increase in the average unit cost of fuels burned. Payments required under the nuclear payback agreement decreased by \$4 million in 1980. Depreciation costs rose \$21 million in 1980 to \$306 million, mainly as the result of additional transformation and transmission facilities being placed in service.

Interest and foreign exchange costs charged to operations totalled \$675 million in 1980, \$20 million or 3% higher than 1979. Interest costs increased by \$72 million or 12% over 1979, reflecting financing costs associated with new fixed assets in service and new borrowings at higher interest rates partially offset by gains on the retirement of bonds. However, foreign exchange costs decreased \$52 million from 1979 mainly as a result of the decreased level of foreign debt retired or refinanced during 1980.

The amount of net income appropriated for debt retirement, as required by The Power Corporation Act, increased by \$12 million in 1980 to \$138 million. The remaining \$78 million balance of 1980 net income was appropriated for stabilization of rates and contingencies compared to \$142 million in 1979.

The overall financial position of the Corporation, as reflected by the debt-equity and interest coverage ratios improved during 1980 as shown below:

Financial Ratios	1980	1979
Debt-Equity	.846	.848
Interest Coverage	1.32	1.26

In 1980 the major application of funds was for the construction of new plant and facilities. Net additions to fixed assets were \$1,470 million, comprised of \$968 million for generation facilities, \$219 million for transmission and distribution facilities, \$76 million for heavy water facilities, \$116 million for the production of heavy water and \$91 million for administration and service assets. Net additions were \$105 million lower than those in 1979, mainly as the result of the reduced level of expenditures on generation and heavy water production facilities. The expenditures during 1980 and 1979 on major generation facilities under construction were:

	1980 Expenditures \$ million	1979 Expenditures \$ million
Major Generation Facilities Under Construction		
Nuclear Generating Stations		
Bruce "B"	435	386
Pickering "B"	291	326
Darlington	69	56
Fossil Generating Stations		
Thunder Bay	89	124
Atikokan	39	25

Other 1980 applications of funds were increases in advance payments for fuel supplies of \$147 million, increases in accounts receivable and other assets of \$78 million and increases in fuel, materials and supplies of \$48 million. In addition, decreases in accounts payable and accrued interest amounted to \$120 million in 1980.

Funds provided from operations in 1980 amounted to \$682 million while net financing provided \$1,180 million. Compared to 1979, these amounts increased by \$130 million and decreased by \$250 million respectively.

Proceeds from the issue of long-term bonds, notes and other long-term debt during 1980 totalled \$1,462 million. Canadian bond issues of \$950 million were floated publicly, and a further \$500 million was issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro. The average coupon interest rate of bond issues in 1980 was 13.0%, as compared to an average rate of 9.9% in 1979. There were no foreign long-term debt issues during 1980. Additional funds were provided by reducing the level of cash and investments by \$195 million and increasing the short-term notes payable by \$124 million. Leases of capital equipment valued at \$12 million provided other long-term financing. Retirement of long-term debt during the year amounted to \$602 million.

Auditors' Report

We have examined the statement of financial position of Ontario Hydro as at December 31, 1980 and the statements of operations, equities accumulated through debt retirement appropriations, reserve for stabilization of rates and contingencies and changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, these financial statements present fairly the financial position of Ontario Hydro as at December 31, 1980 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Toronto, Canada
March 30, 1981

CLARKSON GORDON
Chartered Accountants

Summary of Significant Accounting Policies

The accompanying financial statements have been prepared by management in accordance with generally accepted accounting principles in Canada, applied on a consistent basis. In management's opinion, the financial statements have been properly prepared within reasonable limits of materiality and in the light of information available up to March 30, 1981. To assist the reader in understanding the financial statements, the Corporation's significant accounting policies are summarized below:

Fixed assets

Fixed assets are capitalized at cost which is comprised of material, labour and engineering costs, plus overheads, depreciation on service equipment and interest applicable to capital construction activities. In the case of generation facilities, cost also includes the net cost of commissioning, and for nuclear generation, the cost of heavy water. The net cost of commissioning is the cost of start-up less the value attributed to energy produced by units during their commissioning period. The cost of heavy water is the direct cost of production and applicable overheads, plus interest and depreciation on the heavy water production facilities. Leases which transfer the benefits and risks of ownership of assets to Ontario Hydro are capitalized.

Interest is capitalized on construction in progress at rates which approximate the average cost of long-term funds borrowed in the years in which expenditures have been made for fixed assets under construction. The effective annual rates were 10.2% in 1980 and 10.0% in 1979.

If it is decided to significantly extend the construction period of a project, interest is not capitalized on construction during the period of extension. If a project is deferred after construction has started, mothballing costs associated with the deferment are charged to operations. Interest is not capitalized on deferred projects during the period of their deferral. If a project is cancelled, all costs, including the costs of cancellation, are written off to operations.

Depreciation

All fixed assets in service, except land, are depreciated on a straight-line estimated service life basis. Depreciation rates for the various classes of assets are based on their estimated service lives, which are subject to periodic review. Any changes in service life estimates are implemented on a remaining service life basis.

The estimated service lives of assets in the major classes are:

Generation	— hydraulic	— 50 to 100 years
	— fossil and nuclear	— 30 years
Heavy water		— over the period ending in the year 2030
Transmission and distribution		— 25 to 55 years
Administration and service		— 5 to 60 years
Heavy water production facilities		— 20 years

In accordance with the group depreciation practices of the utility industry, for normal retirements the cost of fixed

assets retired is charged to accumulated depreciation with no gain or loss being reflected in operations. However, gains and losses on sales of fixed assets, losses on premature retirements, and the costs of removal less salvage proceeds on all retirements, are charged to operations in the year incurred as adjustments to depreciation expense.

Fixed assets removed from service and mothballed for future use are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected non-operating period.

Deferred projects are amortized so that any estimated loss in value is charged to operations on a straight-line basis over their expected deferral period.

Advance payments for fuel supplies

As part of its program to ensure the adequate supply of fuels for its generating stations, Ontario Hydro has entered into long-term fuel supply contracts. Where these contracts require Ontario Hydro to make payments to suppliers in advance of product delivery for pre-production costs, these payments and associated costs, including interest, are carried in the accounts as advance payments for fuel supplies. The advance payments are amortized to fuel inventory as the fuels are delivered.

Fuel for electric generation

The cost of fuel for electric generation is comprised of fuel purchases, transportation and handling costs, and the amortization of advance payments for fuel supplies. Transportation costs include interest and depreciation on railway equipment owned by Ontario Hydro. Fuel used for electric generation is charged to operations on the average cost basis.

Nuclear agreement — Pickering units 1 and 2

Ontario Hydro, Atomic Energy of Canada Limited and the Province of Ontario are parties to a joint undertaking for the construction and operation of units 1 and 2 of Pickering Nuclear Generating Station, with ownership of these units being vested in Ontario Hydro. Contributions to the capital cost by Atomic Energy of Canada Limited and the Province of Ontario amounted to \$258 million and these have been deducted in arriving at the value of fixed assets in service in respect of Pickering units 1 and 2. Ontario Hydro is required to make monthly payments until the year 2001 to each of the parties in proportion to their capital contributions. These payments, termed "payback", represent in a broad sense the net operational advantage of having the power generated by Pickering units 1 and 2 as compared with coal-fired units similar to Lambton units 1 and 2.

Commissioning energy

Revenues from the sale of power and energy include revenues from energy produced by generating units during the commissioning period. A charge is included in the cost of operations for the value attributed to the energy produced during the commissioning period. This charge is equivalent to the operating and fuel costs of

producing the same quantity of energy at generating units displaced because of the commissioning activity.

Appropriations from net income

Under the provisions of The Power Corporation Act, the price payable by customers for power is the cost of supplying the power. Such cost is defined in the Act to include the cost of operating and maintaining the system, depreciation, interest, and the amounts appropriated for debt retirement and stabilization of rates and contingencies.

The debt retirement appropriation is the amount required under the Act to accumulate in 40 years a sum equal to the debt incurred for the cost of the fixed assets in service. The appropriation for, or withdrawal from, the stabilization of rates and contingencies reserve is an amount established to maintain a sound financial position and to stabilize the effect of cost fluctuations.

Foreign currency translation

Long-term debt payable in foreign currencies is translated to Canadian currency at rates of exchange at the time of issue. Current monetary assets and liabilities,

including long-term debt payable within one year, are adjusted to Canadian currency at year-end rates of exchange. The resulting translation gains or losses, together with realized exchange gains or losses, are credited or charged to operations.

Pension plan

The pension plan is a contributory, defined benefit plan covering all regular employees of Ontario Hydro. The pension costs for each period, as actuarially determined, include current service costs and amounts required to amortize any surpluses or unfunded liabilities. Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Research and development

Research and development costs are charged to operations in the year incurred, except for those related directly to the design or construction of a specific capital facility. Prior to 1979, certain development costs and expenditures related to the overall planning of the power system had been capitalized and are being amortized over a 10 year period.

Statement of Operations for the year ended December 31, 1980

	1980 \$'000	1979 \$'000
Revenues		
Primary power and energy		
Municipal utilities	1,603,072	1,441,557
Rural retail customers	513,616	474,795
Direct industrial customers	341,785	305,210
	<u>2,458,473</u>	<u>2,221,562</u>
Secondary power and energy (note 2)	360,742	346,558
	<u>2,819,215</u>	<u>2,568,120</u>
Costs		
Operation, maintenance and administration	639,572	601,422
Fuel used for electric generation (note 3)	673,856	605,839
Power purchased	99,490	98,456
Nuclear agreement — payback	49,038	53,195
Commissioning energy	229	2,776
Depreciation (note 4)	305,967	284,610
	<u>1,768,152</u>	<u>1,646,298</u>
Income before financing charges and extraordinary item	<u>1,051,063</u>	<u>921,822</u>
Interest (note 5)	655,399	583,332
Foreign exchange (note 6)	19,238	70,875
	<u>674,637</u>	<u>654,207</u>
Income before extraordinary item	376,426	267,615
Extraordinary item (note 1)	160,000	—
Net income	<u>216,426</u>	<u>267,615</u>
Appropriation for:		
Debt retirement as required by		
The Power Corporation Act	137,743	125,932
Stabilization of rates and contingencies	78,683	141,683
	<u>216,426</u>	<u>267,615</u>

See accompanying summary of significant
accounting policies and notes to financial statements

Statement of Financial Position as at December 31, 1980

Assets	1980 \$'000	1979 \$'000
Fixed assets		
Fixed assets in service (note 7)	10,887,352	10,441,984
Less accumulated depreciation	<u>2,443,317</u>	<u>2,147,326</u>
	8,444,035	8,294,658
Construction in progress (note 7)	4,801,293	3,674,929
Deferred construction projects (note 8)	<u>384,849</u>	<u>659,255</u>
	<u>13,630,177</u>	<u>12,628,842</u>
Current assets		
Cash and short-term investments (note 9)	239,118	381,102
Accounts receivable	346,840	292,643
Fuel for electric generation (note 10)	618,262	579,209
Materials and supplies, at cost	<u>144,179</u>	<u>132,905</u>
	<u>1,348,399</u>	<u>1,385,859</u>
Other assets		
Advance payments for fuel supplies (note 11)	414,105	267,383
Unamortized debt discount and expense	121,829	117,567
Long-term accounts receivable and other assets	78,837	60,652
Long-term investments	<u>—</u>	<u>53,426</u>
	<u>614,771</u>	<u>499,028</u>
	<u>15,593,347</u>	<u>14,513,729</u>

See accompanying summary of significant
accounting policies and notes to financial statements.

Liabilities	1980 \$'000	1979 \$'000
Long-term debt		
Bonds and notes payable (note 12)	12,103,349	11,515,725
Other long-term debt (note 13)	272,355	309,330
	<u>12,375,704</u>	<u>11,515,725</u>
Less payable within one year	370,646	381,540
	<u>12,005,058</u>	<u>11,134,185</u>
Current liabilities		
Accounts payable and accrued charges	470,032	618,455
Short-term notes payable	144,525	20,070
Accrued interest	318,809	289,941
Long-term debt payable within one year	370,646	381,540
	<u>1,304,012</u>	<u>1,310,006</u>
Contingencies (notes 3, 7 and 8)		
Equity		
Equities accumulated through debt retirement appropriations	1,651,937	1,518,000
Reserve for stabilization of rates and contingencies	505,645	426,817
Contributions from the Province of Ontario as assistance for rural construction	126,695	126,695
	<u>2,284,277</u>	<u>2,069,538</u>
	<u>15,593,347</u>	<u>14,513,729</u>

On behalf of the Board

Henry A. Macaulay

Chairman

M. Nastich

President

Toronto, Canada
March 30, 1981

**Statement of Equities Accumulated through
Debt Retirement Appropriations
for the year ended December 31, 1980**

	Municipal Utilities	Power District (Rural Retail and Direct Industrial Customers)	Totals	
	\$'000	\$'000	1980	1979
	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	1,058,611	457,415	1,516,026	1,391,181
Debt retirement appropriation	93,025	44,718	137,743	125,932
Transfers and refunds on annexations by municipal utilities	6,820	(8,652)	(1,832)	(1,087)
Balances at end of year	<u>1,158,456</u>	<u>493,481</u>	<u>1,651,937</u>	<u>1,516,026</u>

**Statement of Reserve for Stabilization
of Rates and Contingencies
for the year ended December 31, 1980**

	Held for the benefit of all customers	Held for the benefit of (or recoverable from) certain groups of customers			Totals	
		Municipal Utilities	Rural Retail Customers	Direct Industrial Customers	1980	1979
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
Balances at beginning of year	450,190	1,144	(24,150)	(367)	426,817	284,917
Appropriation	54,474	110	22,599	1,500	78,683	141,683
Transfers and recoveries on annexations by municipal utilities	(253)	—	508	—	255	326
Payment to Ontario Municipal Electric Association (note 14)	—	(110)	—	—	(110)	(109)
Balances at end of year	<u>504,411</u>	<u>1,144</u>	<u>(1,043)</u>	<u>1,133</u>	<u>505,645</u>	<u>426,817</u>

See accompanying summary of significant
accounting policies and notes to financial statements.

Statement of Changes in Financial Position for the year ended December 31, 1980

	1980	1979
	\$'000	\$'000
		(note 18)
Source of Funds		
Operations		
Income before extraordinary item	376,426	267,615
Depreciation, a charge not requiring funds in the current year . . .	305,967	284,610
	682,393	552,225
Financing		
Long-term debt		
Bonds and notes payable and other long-term debt issued . .	1,462,089	1,404,844
Less retirements	602,110	287,794
	859,979	1,117,050
Short-term notes payable — increase (decrease)	124,455	(5,345)
Cash and investments — decrease	195,410	317,911
	1,179,844	1,429,616
	1,862,237	1,981,841
Application of Funds		
Net additions to fixed assets (note 15)	1,469,550	1,574,716
Increase in advance payments for fuel supplies	146,722	126,680
Decrease in accounts payable and accrued interest	119,555	27,227
Increase in accounts receivable and other assets	78,331	65,239
Increase in fuel, materials and supplies	48,079	187,979
	1,862,237	1,981,841

See accompanying summary of significant accounting policies and notes to financial statements.

Notes to Financial Statements

1. Extraordinary item

As a result of the 1980 and 1981 forecasts projecting reduced rates of growth in future electrical demand, and the fact that recent studies indicate it is cost effective to install nuclear and hydraulic generation before adding more fossil-fueled stations, the plan to complete an oil-fueled generating station at Wesleyville was cancelled effective December 31, 1980. An extraordinary charge of \$160 million was made against income for 1980 to write off the construction project costs and to provide for the estimated costs of cancellation. These estimates reflect the best current judgment of management but may be subject to adjustment when the final amounts are known. (See note 8.)

2. Secondary power and energy

Secondary power and energy is comprised mainly of revenues of \$359 million in 1980 (1979 — \$345 million) from sales of electricity to United States utilities.

3. Fuel used for electric generation

Ontario Hydro has contracted with Petrosar Limited for the supply of 20,000 barrels of residual fuel oil per day through to April 1992. Because of reduced requirements, deliveries in 1979 and 1980 were less than the contract quantity. As compensation, Ontario Hydro paid \$11 million to Petrosar Limited in 1979, and is negotiating with them concerning the acceptance of lower than contracted deliveries in 1980. Pending the outcome of these negotiations, no estimate of the cost is possible and therefore no provision was made in 1980.

4. Depreciation

	1980	1979
	\$'000	\$'000
Depreciation of fixed assets in service	334,901	326,070
Amortization of deferred construction projects	13,954	8,156
Costs of removal less salvage proceeds on retirements	2,573	3,894
	<u>351,428</u>	<u>338,120</u>
Less:		
Depreciation charged to — heavy water production	21,605	22,269
— construction in progress	17,636	16,435
— fuel for electric generation	2,248	2,225
Net gains on sales of fixed assets	3,972	12,581
	<u>45,461</u>	<u>53,510</u>
	<u>305,967</u>	<u>284,610</u>

Depreciation of fixed assets in service includes \$3.7 million (1979 — \$0.4 million) for the amortization of non-operating generating units which have been mothballed for future use. (See note 7.)

5. Interest

	1980	1979
	\$'000	\$'000
Interest on bonds, notes, and other debt	1,165,921	1,029,568
Less:		
Interest charged to — construction in progress	328,985	282,213
— heavy water production	34,343	35,865
— advance payments for fuel supplies	29,323	18,295
— fuel for electric generation	8,603	4,700
Interest earned on short-term and long-term investments	72,664	89,459
Net gain on redemption of bonds and sale of investments	36,604	15,704
	<u>510,522</u>	<u>446,236</u>
	<u>655,399</u>	<u>583,332</u>

6. Foreign exchange

	1980	1979
	\$'000	\$'000
Exchange loss on redemption and translation of foreign long-term debt	23,470	30,052
Exchange loss on refinancing of foreign long-term debt	—	33,281
Net exchange (gain) loss on other foreign transactions	(4,232)	7,542
	<u>19,238</u>	<u>70,875</u>

7. Fixed assets

	1980			1979		
	Assets in Service	Accumulated Depreciation	Construction in Progress	Assets in Service	Accumulated Depreciation	Construction in Progress
Generation — hydraulic . .	1,733,004	390,861	11,714	1,729,400	360,153	8,976
— fossil	2,254,239	635,175	549,632	2,231,864	556,224	377,204
— nuclear	1,896,320	245,889	2,781,114	1,878,802	183,467	1,930,619
Heavy water	589,484	66,533	249,134	589,484	56,227	110,632
Transmission and distribution	3,396,803	783,017	326,307	3,063,815	722,375	456,491
Administration and service	547,038	200,329	24,752	502,776	170,882	8,098
Heavy water production facilities	470,464	121,513	858,640	445,843	97,998	782,909
	<u>10,887,352</u>	<u>2,443,317</u>	<u>4,801,293</u>	<u>10,441,984</u>	<u>2,147,326</u>	<u>3,674,929</u>

As a result of recent forecasts projecting reduced rates of growth in future electrical demand, certain fossil-fueled generating units were mothballed for future use; during 1979, three units at the R. L. Hearn Generating Station, and during 1980, a further two units at R. L. Hearn and two units at the Lennox Generating Station were mothballed. The capital cost and accumulated depreciation of these non-operating units, amounting to \$268 million and \$76 million, respectively (1979 — \$33 million and \$22 million, respectively), are included in fossil generation assets in service. At this time it is uncertain when these units will resume operation.

The mothballing costs associated with these units were charged to operations as incurred. The costs of mothballing these units were not significant.

Construction in progress at December 31, 1980 is comprised of:

	Planned In-Service Dates	Generating Capacity to be Installed MW	Costs Incurred to December 31, 1980 \$ millions	Estimated Future Costs to Complete (Including Escalation) \$ millions
Nuclear generating stations (including heavy water)				
Pickering "B"	1983-84	2,160	1,685	1,430
Bruce "B"	1983-87	3,200	1,053	3,500
Darlington	1988-91	3,600	188	6,500
Fossil generating stations				
Thunder Bay	1981-82	300	385	50
Atikokan	1984-88	400	88	850
Bruce Heavy Water Plant "B"	1981	—	859	130
All other construction in progress	—	—	543	—
			<u>4,801</u>	

The above estimates are the most recent forecasts as of March 30, 1981. Because of long construction lead times on these projects, the assumptions underlying these forecasts are subject to change which may affect the planned in-service dates and estimated future costs to complete.

8. Deferred construction projects

	1980			1979		
	Capital Cost	Accumulated Amortization	Unamortized Cost	Capital Cost	Accumulated Amortization	Unamortized Cost
Bruce Heavy Water Plant "D"	395,840	13,540	382,300	419,013	3,850	415,163
Wesleyville Generating Station	—	—	—	244,520	3,733	240,787
Minor projects	5,724	3,175	2,549	5,941	2,636	3,305
	<u>401,564</u>	<u>16,715</u>	<u>384,849</u>	<u>669,474</u>	<u>10,219</u>	<u>659,255</u>

As a result of forecasts projecting reduced rates of growth in future electrical demand, the Board of Directors made the following revisions to the capital construction program:

Bruce Heavy Water Plant "D"
In 1978, it was decided to stop construction on the second half of the plant and store the components. In 1979 it was decided to complete construction and then mothball the first half of the plant. It is uncertain at this time when the plant will be used.

Wesleyville Generating Station
In 1978, units 1 and 2 were cancelled and associated costs of \$20.5 million were written off as an extraordinary charge against income. In 1979, it was decided to stop construction on units 3 and 4 and store the components. The plan to complete the Wesleyville oil-fueled generating station was cancelled effective December 31, 1980. (See note 1.)

Mothballing costs associated with the above deferrals amounting to \$15 million and \$20 million were charged to operations in 1978 and 1979, respectively. There were no mothballing costs incurred in 1980.

9. Cash and short-term investments

	1980	1979
	\$'000	\$'000
Cash and interest bearing deposits with banks and trust companies	67,012	276,366
Corporate bonds and notes	53,580	85,628
Government and government-guaranteed securities	118,526	19,108
	<u>239,118</u>	<u>381,102</u>

Corporate bonds and notes were recorded at cost which approximates market value. Government and government-guaranteed securities were recorded at the lower of cost or market value; market value as at December 31, 1980 was \$120 million (1979 — \$19 million).

10. Fuel for electric generation

	1980	1979
	\$'000	\$'000
Inventories — coal	484,511	460,115
— uranium	100,608	87,903
— oil	33,143	31,191
	<u>618,262</u>	<u>579,209</u>

11. Advance payments for fuel supplies

	1980	1979
	\$'000	\$'000
Coal	99,799	89,694
Uranium	314,306	177,689
	<u>414,105</u>	<u>267,383</u>

Based on present commitments, additional advance payments for fuel supplies, excluding interest, will total approximately \$322 million over the next five years, including approximately \$142 million in 1981.

12. Bonds and notes payable

Bonds and notes payable, expressed in Canadian dollars, are summarized by years of maturity and by the currency in which they are payable in the following table:

1980					1979	
Years of maturity	Principal Outstanding \$'000		Weighted Average Coupon Rate		Principal Outstanding \$'000	Weighted Average Coupon Rate
	Canadian	Foreign	Total		Total	
1980	—	—	—		364,917	
1981	237,609	116,931	354,540		328,474	
1982	206,434	179,722	386,156		433,941	
1983	171,679	203,447	375,126		375,199	
1984	99,130	115,634	214,764		214,763	
1985	566,082	294,719	860,801		—	
1 — 5 years	1,280,934	910,453	2,191,387	8.9%	1,717,294	7.1%
6 — 10 years	252,877	517,383	770,260	7.5	1,016,246	7.8
11 — 15 years	382,643	176,062	558,705	8.5	540,668	7.9
16 — 20 years	1,738,349	624,915	2,363,264	9.3	1,616,009	8.2
21 — 25 years	1,704,093	1,101,671	2,805,764	9.3	2,390,550	9.4
26 — 30 years	1,464,357	1,949,612	3,413,969	10.0	3,925,628	9.4
	<u>6,823,253</u>	<u>5,280,096</u>	<u>12,103,349</u>		<u>11,206,395</u>	
Currency in which payable						
Canadian dollars			6,823,253		5,557,206	
United States dollars			5,132,709		5,338,998	
West German Deutsche marks			90,663		95,911	
Swiss francs			56,724		214,280	
			<u>12,103,349</u>		<u>11,206,395</u>	

The bonds and notes payable in United States dollars include \$3,949 million (1979 — \$4,072 million) of Ontario Hydro bonds held by the Province of Ontario and having terms identical with Province of Ontario issues sold in the United States on behalf of Ontario Hydro. Except for these bonds and \$500 million of bonds issued to the Province of Ontario with respect to Canada Pension Plan funds advanced to Ontario Hydro, all bonds and notes payable are guaranteed as to principal and interest by the Province of Ontario.

The long-term bonds and notes payable in foreign currencies are translated into Canadian currency at rates of exchange at time of issue. If translated at year-end rates of exchange, the total amount of these liabilities would have to be increased by \$794 million at December 31, 1980 (1979 — \$730 million).

13. Other long-term debt

	1980	1979
	\$'000	\$'000
The balance due to Atomic Energy of Canada Limited for the purchase of Bruce Heavy Water Plant "A". Under the purchase agreement, Ontario Hydro pays equal monthly instalments of blended principal and interest to December 28, 1992, with interest at the rate of 7.795%	197,549	207,223
Capitalized lease obligation for the head office building at 700 University Avenue, Toronto. The lease obligation is for the 30-year period ending September 30, 2005, payable in United States dollars at an effective interest rate of 8%.	42,455	42,960
Capitalized lease obligations for transport and service equipment. Under these agreements, monthly instalments of blended principal and interest will be paid to 1988, at effective interest rates ranging from 6.8% to 18.25%.	32,351	21,344
Liability for borrowed uranium.	—	37,803
	<u>272,355</u>	<u>309,330</u>

Payments required on the above debt, exclusive of interest, will total \$91 million over the next five years. The amount payable within one year is \$16 million (1979 — \$17 million).

14. Payment to Ontario Municipal Electric Association

The amount of this payment is equivalent to interest on the balance held for the benefit of Municipalities in the Reserve for Stabilization of Rates and Contingencies.

15. Net additions to fixed assets

Net additions to fixed assets are capital construction expenditures less the proceeds on sales of fixed assets. In 1980, net additions to fixed assets reflect proceeds on sales amounting to \$76 million (1979 — \$114 million). For 1981, net additions to fixed assets are forecast at \$2,260 million.

16. Pension plan

The most recent actuarial valuation of Ontario Hydro's pension plan as at December 31, 1979 reported a surplus of approximately \$81 million (December 31, 1978 — an unfunded liability of approximately \$23 million). The actual rate of return on pension plan investments for 1979 exceeded the rate assumed in the 1978 actuarial valuation resulting in the elimination of the unfunded liability as at December 31, 1978.

The significant actuarial assumptions used in the 1979 valuation (1978 valuation) were:

- rate used to discount future investment income and benefits 7% (1978 — 7%)
- salary escalation rate 6.75% (1978 — 6.75%)
- average retirement age 62.2 for males, 61.9 for females (1978 — 62.4 and 61.0, respectively)
- common stocks valuation 5 year average (1978 — 5 year average)

The pension plan costs for 1980 were \$43 million (1979 — \$48 million), after a reduction of \$7 million for amortization of pension plan net surpluses (1979 — after including \$4 million for the amortization of pension plan unfunded liabilities).

17. Research and development

In 1980, approximately \$41 million of research and development costs were charged to operations and \$4 million were capitalized (1979 — \$39 million and \$4 million, respectively).

18. Comparative figures

Certain of the 1979 comparative figures have been reclassified to conform with the 1980 financial statement presentation.

Pension and Insurance Fund Statement of Assets as at December 31, 1980

	1980 \$'000	1979 \$'000
Fixed income securities		
Government and government-guaranteed bonds	299,974	286,541
Corporate bonds	173,055	143,125
First mortgages	375,340	340,026
Total fixed income securities	848,369	769,692
Equities — corporate shares	343,282	269,531
Cash and short-term investments	72,283	87,957
Total investments	1,263,934	1,127,180
Accrued interest and dividends	17,224	15,915
Receivable from Ontario Hydro	2,965	748
	<u>1,284,123</u>	<u>1,143,843</u>

Notes

1. Accounting Policies

In the above statement of assets which is prepared on the accrual basis of accounting, bonds are included at amortized cost, first mortgages at balance of principal outstanding and shares at cost. Total bonds and shares at December 31, 1980 with a book value of \$816 million had a market value of \$928 million (1979 — \$699 million and \$732 million, respectively).

2. Actuarial Valuation

The most recent actuarial valuation of Ontario Hydro's pension plan at December 31, 1979 reported a surplus of approximately \$81 million (December 31, 1978 — an unfunded liability of approximately \$23 million). Pension plan surpluses or unfunded liabilities are amortized over a fifteen year period.

Auditors' Report

(Pension and Insurance Fund)

We have examined the statement of assets of The Pension and Insurance Fund of Ontario Hydro as at December 31, 1980. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as we considered necessary in the circumstances.

In our opinion, the accompanying statement presents fairly the assets of the fund as at December 31, 1980 in accordance with the accounting policies described in note 1 applied on a basis consistent with the preceding year.

Toronto, Canada
March 30, 1981

CLARKSON GORDON
Chartered Accountants

